

CHIEF ENGINEER'S ANNUAL REPORT NO.
FOR THE YEAR 1946

January 13, 1947

TO THE JOINT BOARD,
INTER COUNTY RIVER IMPROVEMENT
KING AND PIERCE COUNTIES, WASHINGTON.

GENTLEMEN: Good Morning.

For your information and approval, I have the privilege of submitting herewith the engineer's annual report with emphasis upon the progress of the work performed during the fourth quarter of 1946.

For the benefit of the recently elected county commissioners of both counties we will briefly review some of the more salient factors governing the operation of the Inter County River Improvement Project both past and present and which we trust may assist you gentlemen in forming a working opinion, and in rendering an unbiased decision upon requirements which confront this flood control project.

A resume of the years operation would not be complete without an expression of appreciation of the valuable assistance and wise council of your Consulting Engineer, Mr. R. H. Thomson, who beyond doubt is in a position to give a most complete and comprehensive review of the entire operation of the Inter County River Improvement project from its inception to the present time. His years of experience as an engineer and his mature judgement has been of invaluable service to this organization for many years and for which I as the present engineer in charge of operation express my most sincere appreciation.

Respectfully,
[Signature]

we
rose to a certain heighth, fortunately or unfortunately as, may view it
the reservoir filled so rapidly that the operator in charge was unable to
get to the control tower of the nine foot tunnel with the result that the
reservoir continued to empound a much greater volume of the flood than they
had intended it should. Had the operator followed explicit instructions
and opened the gate the flood in White River from Mud Mountain Dam to
its confluence with the Puyallup at Sumner, would no doubt, have been very
near that of the flood of 1933-34. We may therefore conclude that the
failure to open the intake resulted in the greatly reduced runoff
thruout the lower river channel.

Another factor that operated advantageously and reduced the
combined flood discharge in the lower river from Sumner to Tacoma was
the fact that the upper Puyallup River did not reach flood stage until
5 p.m. Dec. 11th, while the flood peak in the White and Stuck Rivers
reached the flood peak approximately 4:30 p.m. December 14th. Had these
two rivers reached flood stage simultaneously the registered peak in the
lower Puyallup River would no doubt have been greatly in excess of the
33,200 c.g.s. which was registered on the U. S. G. S. gaging Station
on the lower Puyallup River.

SUMMARY OF MAINTENANCE PERFORMED DURING 1946

1. AUBURN SECTION

- a. Placed rock along face of Auburn Concrete Diversion
dam, 168 cubic yards.
- b. Placed rock opposite Auburn Dam on left bank along
access road, 500 cubic yards.
- c. Placed rock on right bank of river 2700 lineal feet
upstream from Auburn Bridge occasioned by flood of
December 11th, 276 cubic yards.
- d. Removed stranded drift thruout this area.

2. COUNTY LINE SECTION

- a. Placed rock on right bank down stream from Auburn Highway Bridge by constructing a series of short groins with 292 cubic yards of rock.

3. DIERINGER SECTION

- a. Repaired rock blanket on right bank at Station 603+00, 148 cubic yards of rock
- b. Repaired eroded levee on left bank 1500 feet down stream from Stewart Road, a distance of 400 lineal feet placing 608 cubic yards of rock.
- c. Repaired rock groins and blanket on left bank 3200 lineal feet down stream from Stewart Road requiring 2548 cubic yards of rock.
- d. Cut brush on right and left banks of river thruout this section.

4. ROESLI SECTION

- a. Repaired old revetment between Stations 256+00 to 357+00 on right bank with 444 cubic yards of rock.
- b. Constructed rock blanket on right bank between Stations 713+00 to 813+00 with 488 cubic yards of rock.
- c. Reestablish Inter County River Improvement property lines, placed concrete monuments and made new map of this Section.

5. PUYALLUP SECTION

- a. Cutting of brush on right bank of river.

6. MURPHY SECTION

- a. Continuation of rock groin from Station 242+00. Repaired damaged levee and revetment occasioned by the flood of 1919. Placed 2624 cubic yards of rock (work to be continued)

7. RESERVATION SECTION

- a. Raising right bank levee between Stations 23+00 to Stations 51+00 requiring 8,959 cubic yards of material which was transported a distance of approximately $3\frac{1}{2}$ miles

Reservation Section continued

- b. Extended groin on right bank between Station 140+00 and Station 150+00, using 484 cubic yards of rock.
- c. Reinforced old revetment on left bank between Station 121+00 and 127+00 with 556 cubic yards of rock.
- d. Placed rock blanket on left bank between Station 120+00 and Station 130+00 with 1024 cubic yards of rock.
- e. Repaired old revetment on right bank between Station 37+00 and Station 48+00 with 800 cubic yards of rock.
- f. Cut brush on left bank between Station 119+00 and 186+00

VISIBLE RESULTS OF THE RECENT FLOOD THRUOUT THE
INTER COUNTY RIVER IMPROVEMENT CHANNEL FROM
AUBURN TO TACOMA

Thruout the Auburn Section a great quantity of drift wood has accumulated resulting in the deflection of the current of the river causing a rather pronounced erosion on the right bank taking out about 6,000 cubic yards of the bank over a distance of 300 feet as well as the blanket rock revetment .

Our emergency maintenance crews were kept on the job during this time placing large anchored fir and cedar trees to prevent the river from breaking the levee at this point which would have allowed it to inundate adjacent farm lands as well as State Highway No. 5. We call attention to this erosion which is traceable primarily to the accumulation of a great amount of drift wood in this immediate area causing the river to leave the normal channel and also the necessity for the removal of this drift before the occurrence of subsequent floods.

Thruout the Auburn and County Line Sections a vastly increased amount of silt, sand, gravel and boulders have been deposited as a result of the recent flood. These two areas have been the perpetual dumping

ground for a major portion of this river borne material which is primarily traceable to the reduced gradient in the channel floor which changes abruptly from 40 feet per mile to approximately 4 feet per mile.

Your attention is directed to photographs of the Auburn and County Line Sections showing results of the flood of 1946 which are attached hereto.

Thruout the lower course of the river channel from the confluence with the Puyallup River at Sumner to the lower terminus of this project, i e, (the east city limits of Tacoma) the erosion to revetted banks during the recent flood has been of minor importance at least as far as can be observed at present. No doubt this is due primarily to the fact that in recent years every effort has been made to observe developing weakness in this very old revetment and to make immediate repairs. Since we are not always able to observe what is occurring beneath the surface of the water we frequently find that even during normal stream flow a pronounced erosion pocket developes that must be given immediate attention if costly maintenance is to be avoided at a later date.

ANTICIPATED MAINTENANCE FOR THE YEAR 1947.

Since it is impossible to predetermine the occurrence, extent and volume of floods that may occur during any period of time or within one year it is quite impossible to accurately list the probable maintenance requirements necessary to keep the Inter County River channel in a reasonable state of repair. The fact that we recently passed thru a major flood period with a minimum loss to the bank stabilization work that has been performed over a period of many years would, I believe, commend the continuation of a careful and economically

operated maintenance program if the work and expenditures of the past thirty years on this project is to be preserved.

A brief outline of some of the more important maintenance items that will be required during the year 1947 and the estimated cost are listed herewith as follows.

1. AUBURN SECTION - 1.6 miles in length

Beginning at the Auburn Concrete Diversion Dam over the old White River channel.

a. Drift Removal

One power dozer and labor crew for approximately
30 days \$4,120.00

b. Replace 6,000 cubic yards of eroded levee 1,200.00

c. Replace rock blanket at erosion points 1,650.00

d. Repair eroded rock groin 5,280.00
\$ 12,250.00

2. COUNTY LINE SECTION- 1.29 miles in length

No immediate maintenance apparent.

3. DIERINGER SECTION - 3.67 miles in length

1,000 lineal feet of bank revetment repair \$ 9,000.00

4. ROESILI SECTION - 2.10 miles in length

a. Rock groin repair on left bank \$ 300.00

b. Channel clearing and brush removal 400.00
\$ 700.00

5. PUYALLUP SECTION - 1.18 miles in length

No immediate maintenance contemplated

6. MURPHY SECTION - 1.32 miles in length

Continue construction of rock groin on
left bank at Station 243+00 \$ 6,300.00

7. RESERVATION SECTION - 3.52 miles in length

a. Continue rock groin construction on right bank between Station 129+00 to Station 150+00	\$6,000.00
b. Repair old revetment at toe of slope	3,000.00
c. Channel clearing and brush removal	600.00
	<u>\$9,600.00</u>

8. OTHER OVERHEAD ITEMS

Salaries: Engineer's and Clerical Help	\$6,660.00
--	------------

9. MISCELLANEOUS ITEMS

a. Insurance and Licenses	200.00
b. Expendable Tools	400.00
c. Material & Supplies	700.00
d. Office Supplies and expenses	650.00
e. Equipment maintenance & Replacement	1000.00
f. Equipment Rental (Trucks etc.)	4800.00
g. Access Road maintenance and repair	1000.00
h. Purchase riprap rock	7000.00
	<u>\$ 15750.00</u>

Estimated Total Maintenance for 1947 \$60,260.00

on the 60/40 basis

By Taxation, Pierce County Budget (approved) \$15,804.00

By Taxation, King County Budget (not ") 23,706.00

Total by Taxation 39,510.00

Estimated revenue from State participating Fund 19,755.00

Total estimated available funds \$59,265.00

Deficiency..... \$ 995.00

FLOOD CONTROL

Flood control on this and other rivers of the Pacific Northwest began with the advent of man's effort to cultivate the soil and to preserve it against erosion, thus permitting him to produce the food to sustain himself and his dependents.

Flood control was and remains absolutely essential to dependable agriculture on the flood plain, for here lies the richest and most productive soils.

From time to time the proposition is advanced that flood protection has been a mistake and that these river valleys should have been allowed to remain in an undeveloped state where the rivers could meander unrestrained and thus save millions of dollars of the tax payers money.

It is certain that the plan to allow these rivers to flow unrestricted has no advocates among the thousands of people who live in these alluvial valleys where the rivers unrestrained could overflow the banks during flood periods beginning from early fall and extending into late spring thereby preventing satisfactory correlation between overflows and farming operations.

Without entering into an exhaustive controversy on the relative merits of the cost of flood control methods compared to the benefits accruing, it is safe at this time to assume that no amount of argument would induce the agriarian population to forsake these fertile valleys, not to mention the people who live in the small towns and villages that occupy these river valleys.

It would be the height of folly to allow the rivers to again ravage these flood plains and to destroy the efforts of years of labor and the great sums of money expended in controlling the floods which periodically menace these areas.

In general, the topography of the region within the province of this flood control project is ideally suited to flood protection by the use of revetted levees which if perpetually maintained will to a degree safeguard the riparian property which is annually being brought under a higher state of cultivation and increased value, also an ever increasing population which in turn permits increased taxation.

Much has been written and many theories advanced relative to cause, occurrence and probable flood damages, likewise the remedies and methods to cope with these forces of nature.

For many years past we have been chiefly occupied with the primary factors of flood control. That is to construct a river channel of sufficient carrying capacity to safely convey flood waters without overflow and to build the adjoining levees of sufficient height and strength to withstand the ravaging force of periodic floods. This phase however, has been but the preliminary step into a wider and more complete effort of flood control as it is being recognized today.

Following channel rectification and bank stabilization the next step has been the construction of a dam to temporarily impound the flood waters for a sufficient length of time to permit a normal flow to pass thru the river channel and then to gradually release the impounded portion of the flood to pass out slowly and thereby prevent overflow in the present channel. In theory this plan would appear

to be the last word in flood control, i e

First, the channel construction, bank stabilization and finally a dam of sufficient height and strength to impound a major portion of a flood when it occurs, but unfortunately some very important factors operating adversely to all of these well designed control efforts are present.

The channel rectification in this river was started 32 years ago and likewise portions of the river bank revetment, but like all material used for this purpose it is subject to deterioration and decay. In the latter case a considerable portion of the original levees and bank revetment built in 1914 to 1919 was destroyed by subsequent floods within five years after their completion thus necessitating their rebuilding. Since this time better and more permanent methods of bank stabilization have been found and used.

Second, the construction of Mud Mountain Dam to temporarily impound flood waters appears at first thought to be the final step in flood control. Unfortunately this dam could not be completed due to the scarcity of critical material required during the war, some of which was needed for the tunnel valve mechanism. At the present time the control of flood waters thru the dam awaits completion. This damlike many other earth filled structures has not as yet passed thru a complete test for strength and stability which it is assumed to possess.

Primarily Mud Mountain Dam was designed to temporarily impound a portion of extreme floods as they occur for reasons that we will discuss later. If governing factors would permit it would have been desirable to construct a dam that would impound the flood waters of the spring season which could be used for irrigation during the late summer months.

Since these rivers carry a great quantity of silt, sand and boulders during high water periods and also a heavy burden of fine sand and silt during normal stream stages some portion of this material is deposited on the floor of the reservoir back of the dam during the impounding period but when the flood waters are completely released from the dam this silt and river borne material is again picked up and carried down stream to be deposited in the shallow areas of the river channel where it is alternately picked up and redeposited until the finest of the materials reaches tide water.

With this prevailing condition we may conclude that the operation of Mud Mountain Dam does not nullify this annoying factor that constantly operates adversely to all efforts of flood control. This silting action in the river channels has long since been recognized as one of the primary factors to be constantly dealt with and in some of the rivers both in this country and Europe its removal requires constant dredging .

During the initial construction period of this project, channel rectification and dredging was performed on an extensive scale, and since that time the tidewater section of the river channel has again been dredged and that area known as the County Line Section has been repeatedly dredged resulting in but temporary relief from this river borne material which persists in filling up the channel. We are therefore confronted with a serious problem, i e , the removal of this river borne material which constantly builds up the floor of the channel and reduces its carrying capacity during flood periods.

In as much as the removal of this river borne material is both costly and gives but temporary relief is is necessary to, if

possible find the source and prevent its being carried into the river channel. The origin of a large portion of this river borne material is not difficult to locate and we may say that it is two-fold, first, we observe that the rivers, such as the White and Puyallup, flow from perpetual snow fields in the higher mountains down over a very steep gradient which produces extremely high stream velocities. These velocities tend to scour the channel sides and floor as may be observed from the deep canyon walls thru which the rivers now flow. Thru the ages these rivers have cut deeper and deeper into the rock formation and soils of the higher elevations carrying this eroded material down and depositing it where stream velocities decrease forming what is now our rich alluvial valleys.

Before the advent of man's effort to clear and cultivate these rich alluvial valleys this silting action was of little consequence, however to-day it becomes a factor of no small importance.

May we for a moment determine the origin of other portions of this river borne silt and sand that is at present being carried by the river at all stages. The cutting and removal of the heavy growth of timber that has covered these mountain slopes for centuries is one of the chief factors which opens up these vast denuded areas to rapid erosion. The winter snows covering these slopes melt much more rapidly when exposed to the direct warm sun of early spring and also to the Chinook winds that frequently sweep the mountain sides during abnormally warm winter days with the result that this blanket of fertile soil which has for ages produced such a magnificent growth of timber, is swept down the mountain slopes by rapid stream runoff and ultimately into the river channels where it is rapidly carried down to further menace the efforts of flood control. With the picture before us you can readily visualize

the necessity for soil conservation as it is advocated to-day as an important adjunct to flood control.

Another factor very closely associated with flood control and one that is receiving marked attention and that will be given greater financial support as its importance is recognized, is the conservation of ground water.

On the Western slopes of the Cascades and particularly as it applies to our immediate problem of flood control, is the excessive rainfall during winter months which taxes the river channels and impounding reservoirs to capacity. This flood water when not controlled is a great liability both as a destructive eroding agent to our fertile soils and damaging great areas by inundation. Should we not therefore, conserve these waters storing them in reservoirs and thereby doing a double service by preventing ravaging floods and later using this impounded water for irrigation. We must recognize that irrigation is receiving much attention and added support here in the Puget Sound area.

This suggestion may be a bit premature but the principal involved is being worked out on a similar plan on the Columbia River at Grand Coulee.

Truck gardening, small fruit culture and dairying are among the chief agriculture pursuits west of the Cascades, each of which requires much more moisture for its complete maturity than is available in the soil during late summer months.

While we are considering our immediate flood problem, may we not overlook these other factors that are receiving deserving attention by the progressive far seeing farmer, and which no doubt will be incorporated in the flood control programs of the foreseeable future.

MAINTENANCE EQUIPMENT

Referring to the 1946 budget, we note an item of \$8,000.00 for the purchase of Dozer Tractor was mentioned.

Thruout the year we have attempted to purchase a suitable tractor from Surplus War Stock but were unable to locate what we considered adequate to our needs and in good working condition.

We also attempted to purchase a piece of new equipment however local agents who handle this type of equipment were unable to secure such from the factory and could not promise delivery before April or May 1947; consequently funds reserved for this purchase remain as an unexpended balance in the Treasurer of King County.

In view of this situation may I request the Board of King County Commissioners to immediately make available for use the unexpended fund balance of 1946 to be used in 1947 for the purchase of suitable Dozer Tractor as soon as it is available.

Attached hereto and being a part of the report are the financial statements for the fourth quarter of the year and also a summary and fund balance.

Respectfully submitted,

F. H. Essig, Chief Engineer
Inter County River Improvement



AUBURN SECTION

View of rock groin built in 1940 on the right bank 3/4 mile up stream from State Highway Bridge. The near destruction to this groin was caused by the flood of December 1946.



COUNTY LINE SECTION

View of river channel 500 feet up stream from Stewart Road Bridge showing amount of gravel deposited in channel by flood of December 1946.



AUBURN SECTION

View looking up stream on right bank showing result of erosion caused by flood of Dec. 11-15, 1946. Temporary repairs made during flood by placing small quantity of rock at a number of places.



View looking down stream on right bank showing erosion resulting from December flood. Same as above.

INTER COUNTY RIVER IMPROVEMENT
DECEMBER 1946

UNIT WORK COSTS FOR THE MONTH

OVERHEAD

Clerk- Salary & insurance	\$130.29
Telephone	17.69
Light & Power	2.43
Supplies	12.42
Salary- Janitor	75.00
Fuel Oil	19.82
	<u>\$ 257.65</u>

ENGINEERING & SURVEY

Salary- Engineer	\$ 325.00
Industrial Insurance	2.87
Salary Consulting Engineer	125.00
Chief Engineer's Car - Operating Gas	11.87
	<u>464.74</u>

EQUIPMENT RENTAL

Contract Trucks for Rock Hauling	\$ 1,807.89
----------------------------------	-------------

EQUIPMENT MAINTENANCE

Ford Flat- gas & License	\$ 2.73
Ford Panel " "	10.44
Studebaker Car License and repair	23.81
	<u>36.98</u>

CHANNEL CLEARING

Labor & Insurance	\$ 169.06
Dozer Rental	200.00
River Patrol	142.08
	<u>511.14</u>

ROCK PLACEMENT

Rock riprap purchased	\$1168.00
Labor	272.80
Industrial Insurance	3.82
Dozer Rental	40.00
	<hr/>
	1484.62

ACCESS ROADS

Labor & Insurance	\$ 10.96
-------------------	----------

RECAPITULATION

OVERHEAD	\$ 257.65
ENGINEERING & SURVEY	464.74
EQUIPMENT RENTAL	1807.89
EQUIPMENT MAINTENANCE	36.98
CHANNEL CLEARING	511.14
ROCK PLACEMENT	1484.62
ACCESS ROADS	10.96
	<hr/>
	4573.98

Vouchers issued in December	\$ 4590.69
-----------------------------	------------

Inventory Gas-Oil Dec. 1	14.71
	<hr/>
	4605.40

Inventory Gas-Oil January 1, 1947	31.42
	<hr/>
	\$ 4573.98

BUDGET 1946

Estimated Revenues	Pierce County	King County	Total Taxation
\$50,000.00	\$20,000.00	\$30,000.00	\$ 50,000.00
Revenues Rec'd to Dec. 31	9,690.15	5,429.87	15,120.02
	29,690.15	35,429.87	65,120.02
Expended Previous Months	25,817.23	26,480.52	52,297.75
	3,872.92	8,949.35	12,822.27
Expended in December	2,540.37	2,050.32	4,590.69
Balance as of Jan. 1-47	\$ 1,332.55	\$ 6,899.03	\$8,231.58

NOTE: \$7,542.22 was deposited to the credit of the Inter County River Improvement in King County during 1945 from the State Department of Conservation and Development as a participating fund. To date this has not been made available for use by the Board of King County Commissioners.

REVENUES IN 1946

From Whom	Deposited Pierce County	Deposited King County
Feb. 8 U. S. Army Bas Auburn	\$180.20	
Mar. 30 Depart. Cons. & Development	2038.12	462.01
June 29 " " "	1495.46	1811.19
Aub. 27 " " "	2672.08	3156.67
Sept. 12 City of Sumner	150.88	
Oct. 14 City of Tacoma	242.95	
Nov. 21 Dept. of Cons. & Development	2910.46	
	<u>\$ 9690.15</u>	<u>\$ 5429.87</u>

INTER COUNTY RIVER IMPROVEMENT

NOVEMBER 1946

UNIT WORK COSTS FOR THE MONTH

OVERHEAD

Clerk Salary and Insurance	\$130.28
Telephone	12.40
Janitor	75.00
Water	5.25
Stove Repair	7.19
	<hr/> 230.12

ENGINEERING & SURVEY

Salary Engineer & Insurance	\$ 327.59
Salary Consulting Engineer	125.00
Expense Acct. " "	17.70
Chief Engineer's Car Operating Gas	9.18
Miscellaneous Supplies	4.10
	<hr/> \$ 483.57

TRUCK AND EQUIPMENT RENTAL

Contract Trucks for rock Hauling	\$ 2358.07
----------------------------------	------------

EQUIPMENT MAINTENANCE

Ford Panel Repairs	49.12
Ford Flat Gas Used	1.29
Ford Panel " "	5.83
Shop Work	48.88
Shop Gas	.26
	<hr/> \$ 105.38

CHANNEL CLEARING

Labor & Insurance	\$ 196.45
-------------------	-----------

ROCK PLACEMENT

1532 c.y. rock	\$ 1532.00
Labor & Insurance	273.66
	<hr/> \$ 1805.66

ACCESS ROADS

Labor & Insurance:

30.62

RECAPITULATION

OVERHEAD
ENGINEERING
TRUCK RENTAL
EQUIPMENT MAINTENANCE
CHANNEL CLEARING
ROCK PLACEMENT
ACCESS ROADS

230.12
483.57
2358.07
105.38
196.45
1805.66
30.62

\$ 5209.87

Vouchers issued in November

\$ 5193.31

Inventory Gas-Oil Nov. 1

$$\begin{array}{r} 31.27 \\ \hline 5224.58 \end{array}$$

Inventory Gas-Oil Dec. 1

14.71
\$ 5209.87

BUDGET

Estimated
Revenues

Pierce
County

King
County

Total
Taxation

\$50,000.00

\$20,000.00

\$30,000.00

\$50,000.00

Revenues Rec'd to Nov. 1

6,779.60

5,429.87

12,209.47

in Nov.

2,910.46

2,910.46

29,690.06

35,429.87

65,119.93

Expended to Nov. 1

23,054.06

24,050.38

47,104.44

6,636.00

11,379.49

18,015.49

Expended in November

2,763.17

2,430.14

5,193.31

Balance as of Dec. 1

3,872.83

8,949.35

12,822.18

INTER COUNTY RIVER IMPROVEMENT

OCTOBER 1946

UNIT WORK COSTS FOR THE MONTH

OVERHEAD

Clerk Salary & Insurance	\$122.68
Telephone	14.60
Supplies	11.67
Janitor Wages & Insurance	75.07
Repair Furnace	8.00
	<u>232.02</u>

ENGINEERING & SURVEY

Salary Chief Engineer	\$ 325.00
Salary Consulting Engineer	125.00
Engineer Car Gas-Oil	12.44
Miscellaneous Supplies	3.61
Survey	292.19
	<u>758.24</u>

EQUIPMENT RENTAL

Contract Trucks Hauling Rock	\$ 2671.93
------------------------------	------------

EQUIPMENT MAINTENANCE

Ford Panel Repair	11.79
Ford Panel Gas-Oil	5.03
Studebaker Car Repair	3.40
Small Hand Tools	13.24
Shop Work	9.39
	<u>42.85</u>

CHANNEL CLEARING

Labor & Insurance	\$ 318.80
-------------------	-----------

SURVEYS BANK AUBURN SECTION

Labor & Insurance	\$ 10.74
-------------------	----------

ROCK PLACEMENT

Rock Riprap , 1800 cubic yards purchased	1800.00
Labor & Insurance	317.97
	<u>2117.97</u>

ACCESS ROADS

Labor & Insurance	\$ 127.91
Dozer Rental	112.00
Labor Bldg. Turn Around	29.01
Labor Build Bridge	18.13
	<u>287.05</u>

RECAPITULATION

OVERHEAD	\$232.02
ENGINEERING & SURVEY	758.24
EQUIPMENT RENTAL	2671.93
EQUIPMENT MAINTENANCE	42.85
CHANNEL CLEARING	318.80
SURVEY BANKS AUBURN SECTION	10.74
ROCK PLACEMENT	2117.97
ACCESS ROADS	287.05
	<u>6439.60</u>

Vouchers issued in October	6461.90
Inventory Gas-Oil Oct. 1	8.97
	<u>6470.87</u>

Inventory Gas-Oil Nov. 1	31.27
	<u>6439.60</u>

BUDGET 1946

Estimated Revenues	Pierce County	King County	Total Taxation
\$50,000.00	\$20,000.00	\$30,000.00	\$50,000.00
Revenues Rec'd to Nov. 1	6,779.60	5,429.87	12,209.47
	<u>26,779.60</u>	<u>35,429.87</u>	<u>62,209.47</u>
Expenditures to November 1	19,708.39	20,934.15	40,642.54
	<u>7,071.21</u>	<u>14,495.72</u>	<u>21,566.93</u>
Expended in Oct.	3,345.67	3,116.23	6,461.90
Balance Fund November 1st	3,725.54	11,379.49	15,105.03